

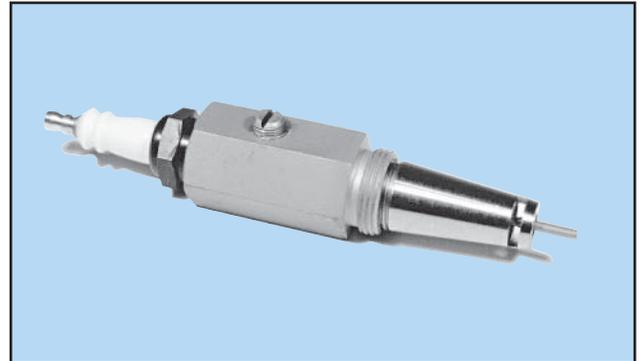
The 4051 series is a unique air enhanced spark igniter that:

- improves ignition by increasing the spark area
- eliminates gas pilot components and pilot maintenance
- increases life by using combustion air to cool the igniter

The 4051 Igniter has the ability to increase the lighting windows typically associated with direct spark ignition on many burners. The stainless steel igniter body, which acts as the spark ground, can not be easily bent or distorted like conventional spark igniters. This construction helps provide repeatable lighting performance. Gas pilots, however, are still preferred for lighting fuels other than natural gas and lighting under high excess air conditions.

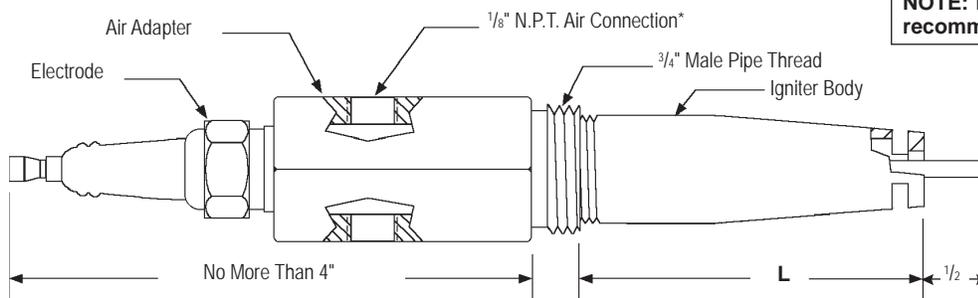
Many Fives North American nozzle mix gas burners can be ignited with 4051 igniters as an alternative to gas pilot or manual torch lighting. Consult your Fives North American salesman to determine if it is applicable to your burner.

Air is supplied through either of two 1/8" NPT taps provided on the igniter assembly (see table below for specific air flow rates). The air source tap should be located upstream of the combustion air control valve.



Standard 6000 volt transformers and ignition cables are used with these igniters. Half wave transformers are not suitable. Fives North American and other flame supervision systems can be designed for direct spark ignition, using a standard detector to monitor the main flame.

Since sparks produce ultraviolet (UV) light which can be detected by UV flame supervision equipment, an ignition timer must be used to keep the spark igniter on 4-5 seconds to give the main flame time to light. Spark igniters **must be shut off** after lighting the main flame.



**NOTE: Half-wave transformers are not recommended with this igniter.**

Igniter size	L dimension
4051-A	1"
4051-B	2 <sup>3</sup> / <sub>8</sub> "
4051-C	2 <sup>7</sup> / <sub>8</sub> "
4051-D	1 <sup>11</sup> / <sub>16</sub> "
4051-E	1 <sup>7</sup> / <sub>8</sub> "

\* This unused tap must be plugged.

DIMENSIONS SHOWN ARE SUBJECT TO CHANGE. PLEASE OBTAIN CERTIFIED PRINTS FROM FIVES NORTH AMERICAN COMBUSTION, INC. IF SPACE LIMITATIONS OR OTHER CONSIDERATIONS MAKE EXACT DIMENSION(S) CRITICAL.

Burner designation	Size	Igniter designation
4422	-2 thru -8	4051-D
4423	-0	4051-D
4423	-1 thru -3	4051-C
4424	-0	4051-D
	-1 thru -3	4051-C
4425	-2 thru -8	4051-D
4442	-0 thru -4	4051-A
	-5 thru -7	4051-D
4832	-2 thru -4	4051-C
	-5 thru -7	4051-B
4836	-2 thru -4	4051-C
	-5 thru -8	4051-B

**AIR FLOW RATES**

Igniter Body Air Pressure	Igniter Air Flow
0.1 osi	33 cfh
0.2 osi	50 cfh
0.5 osi	77 cfh
1 osi	121 cfh
2 osi	172 cfh

## OPERATION TIPS

The 4051 Igniter has a very wide tolerance of air settings, but if the air flow through the igniter is set at extremes, the spark may be unacceptable for lighting the burner. If the air is turned off or is set very low, the spark will arc at a single point on the igniter body (Figure 1). If the air is set very high, the fuel/air ratio around the spark may be so "lean" that the burner will not light (Figure 2). With the ideal amount of air, multiple arcs are produced around at least 120 degrees of the electrode (Figure 3). These arcs should travel along the entire length of the exposed electrode. One setup technique is to observe the spark outside the burner and adjust the air until the optimum spark is achieved.

Do not use the 4051 spark igniter with premix burners or burners that must be lit at high excess air rates. The burner excess air lighting limit is dependent on the fuel/air ratio at the ignition source. 4442 Tempest® burners can be lit at higher excess air rates than 4422 style burners due to their higher excess air limit.

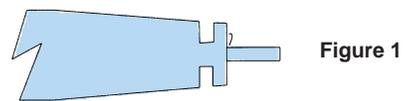


Figure 1

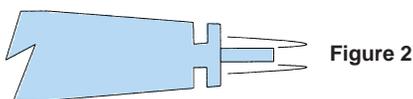


Figure 2

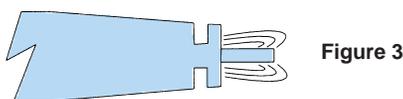


Figure 3

## REPLACEMENT ELECTRODE

Replacement spark electrodes with the ceramic centering spider attached are available. The final length of the electrode is determined by cutting off the excess length after the electrode is assembled in the igniter body. Cut the electrode rod with a hack saw or heavy wire cutters leaving 1/2" of the rod protruding from the igniter body.

## INSTALLATION

1. Install igniter into 3/4" NPT pilot/igniter fitting in burner. For easy removal, use an anti seize compound on igniter threads and finger tighten only. Over tightening with a wrench could cause the igniter to bind and seize in the burner body.
2. Connect assisting air supply to igniter assembly through either of the two 1/8" NPT taps provided. Assisting air must be tapped from a 6-20 psi air source (P1). The combustion air header upstream of the main air valve is an excellent source of ignition assisting air. The igniter air supply line should be 1/4" tubing. The unused tap can be used to read the air pressure in the igniter body (P2). The air pressure in the igniter body (P2) will be much lower than the air pressure at the supply source (P1).
3. A limiting orifice valve should be placed in the igniter air supply line if the igniter air supply pressure is greater than 20 psi, or if lighting a 4442-0 to -4 Tempest burner. The limiting orifice valve can be set by adjusting the air supply until the igniter body pressure (P2) is 0.2-1 psi. Small Tempest burners light best with lower air pressures at the igniter.
4. Connect the ignition cable from the transformer to the igniter. The transformer and the igniter must be grounded.

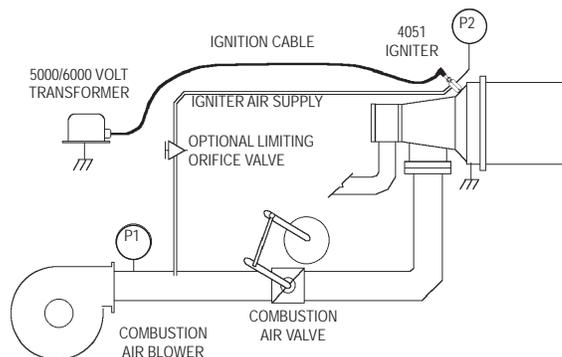


Figure 4

## PARTS LIST

Igniter Size	A	B	C	D	E
Air Adapter	4-17523-1	4-17523-1	4-17523-1	4-17523-1	4-17523-1
Igniter Body	4-20169-1	4-20168-1	4-20168-2	4-20168-3	4-20168-4
Insulating Spider	3-5585-1	3-5585-1	3-5585-1	3-5585-1	3-5585-1
Electrode w/Spider	4-20825-1	4-20825-2	4-20825-3	4-20825-4	4-20825-5
Bushing	R590-0306	—	—	—	—
Pipe Plug	R590-7805	R590-7805	R590-7805	R590-7805	R590-7805

**WARNING:** Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and Insurance Underwriters recommendations, and care in operation.